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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/037,043	11/09/2001	Julian Mitchell	476-2062	5564
23644	7590	08/09/2006	EXAMINER	
BARNES & THORNBURG, LLP			BENGZON, GREG C	
P.O. BOX 2786			ART UNIT	
CHICAGO, IL 60690-2786			PAPER NUMBER	
			2144	

DATE MAILED: 08/09/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

10/037,043

Applicant(s)

MITCHELL ET AL

Examiner

Greg Bengzon

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 08 June 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1- 13, 15-20, 23- 25, 27, 29-31 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1- 13, 15-20, 23- 25, 27, 29-31 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

### **DETAILED ACTION**

This application has been examined. Claims 1- 13, 15-20,23- 25,27, 29-31 are pending. Claims 14, 21, 22,26 and 28 have been cancelled.

### ***Priority***

The effective date of the subject matter in the claims in this application is November 9, 2001.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-3,6-12, 15-16, 18-19, 23-25, 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Schuster et al. (US Patent 6822957) hereinafter referred to as Schuster, in view of Huitema (IETF Working Document 'MIDCOM Scenarios').

With respect to Claim 1, Schuster discloses a method of controlling one of a plurality of NAT devices in a communications network, each of the NAT devices being connected to a plurality of entities in a respective one of a plurality of address realms of the communications network, (Figures 1-2, 9-10, 13-14) said method comprising the steps of: (i) receiving a control message at a NAT -identity-providing node in the communications network, said control message comprising information about one of the entities in the communications network; (Column 19 Lines 15-30) (ii) using the NAT identity providing node to determine the identity of a first NAT connected to said one entity in its respective one of a plurality of address realms; (Column 19 Lines 40-65) (iii) sending said identity to a NAT control node (Item 24) in the communications network in order to enable said NAT control node to send NAT control messages control said first NAT, said NAT control node being located in a different address realm than that of said one of the entities ; and wherein the NAT -identity-providing node (Items 26, 38, 40, 44) is separate from the NAT control node (Item 24) and is located in a control signal path from said one of the entities than the NAT control node. (Column 18 Lines 50-65, Column 23 Lines 10-50)

Schuster does not disclose (re. Claim 1) of a middlebox device in the network.

Huitema disclosed (re. Claim 1) that a middlebox may be a NAT inside a private network. (Huitema - Page 1, Abstract) Thus, the middlebox described in Claim 1 is equivalent to the NAT/Firewall disclosed by Schuster.

Huitema disclosed of different scenarios for describing the MIDCOM protocol as used for devices in the network that provide transport policy enforcement. Huitema disclosed that examples of said 'policy enforcement' devices include firewall and network address translators, such devices being a subset of what are otherwise referred to as 'middleboxes'. (Huitema - Page 1, Abstract) Huitema also disclosed (re. Claims 4,5,20,21) that session description protocol (SDP) messages may be used to initiate and facilitate the communication control process between the middleboxes and the other devices involved. The SDP messages may include identification information regarding the middlebox.( Huitema – Page 13, Section 2.3.6 Multiple Ports, Port Ranges)

Schuster and Huitema are analogous art because they present concepts and practices regarding communication control for middlebox devices such as NATs and firewalls. At the time of the invention it would have been obvious to combine the teachings on middleboxes and SDP messages by Huitema into Schuster . The combination of Huitema into the network of Schuster would enable the public and private networks (and their respective call control management systems) of Schuster to recognize and control the NAT as a 'middlebox'. The suggested motivation for said combination would be, as Huitema suggests, enable the network of Schuster to 1) allow for third parties to provide transport policy enforcement, and 2) overcome the traversal scenarios that Huitema describes. (Abstract, Introduction)

With respect to Claim 2, Schuster discloses a method as claimed in claim 1 wherein said step (iii) of sending said identity comprises adding said identity to a control message and sending said control message. (Figure 13-14, Column 23 Lines 20-25)

With respect to Claim 3, Schuster discloses a method as claimed in claim 2 wherein additional information is also added to the control message. (Figure 13-14, Column 23 Lines 20-25)

With respect to Claim 6, Schuster discloses a method as claimed in claim 1 wherein said control message is a call set-up message and said method further comprises controlling said first NAT in order to set-up a call from said one entity to another entity connected to a second NAT in the communications network. (Column 19 Lines 15-30)

With respect to Claim 7, Schuster discloses a method as claimed in claim 6 wherein said second NAT is connected to a plurality of entities in a second address realm different from the first address realm of the entities connected to the first NAT . (Figure 1, Column 5 Lines 30-50)

With respect to Claim 8, Schuster discloses a method as claimed in claim 7 wherein the NAT control node is within a third address realm different from the first and second address realms. (Figure 1, Column 5 Lines 30-50)

With respect to Claim 9, Schuster discloses a method as claimed in claim 8 wherein the third address realm is public. (Figure 1, Column 5 Lines 30-50)

With respect to Claim 10, Schuster discloses a method as claimed in claim 9 wherein the first and second address realms are private. (Figure 1, Column 5 Lines 30-50)

With respect to Claim 11, Schuster discloses a method as claimed in claim 1 wherein the NAT -identity-providing node is selected from: one of the NATs; a gateway in the communications network; said one entity, being a user terminal in the communications network; a gateway comprising a business services channel manager (BSCM). (Column 19 Lines 45-55)

With respect to Claim 12, Schuster discloses a method as claimed in claim 6 wherein said call passes through two or more NAT s and wherein information about the identity of each such NAT is added to said control message. (Figure 7, Column 14 Lines 20-45, Column 22 Lines 60-65)

With respect to Claim 15, Schuster discloses a method as claimed in claim 1 wherein each of the NATs is selected from a firewall, a network address translator (NAT), and a quality of service device . (Column 6 Lines 25-30)

With respect to Claim 16, Schuster discloses a method as claimed in claim 1 wherein said NAT -identity-providing node is arranged to determine the identity of the first NAT by using pre-specified information. (Column 16 Lines 30-40)

With respect to Claims 18-19, the Applicant describes a communications network having the same limitations as described in Claims 1-12, 15-16. Claims 18-19 are rejected on the same basis as Claims 1-12, 15-16.

With respect to Claims 23 the Applicant describes a control node with the same limitations as described in Claims 1-12, 15-16. Claims 23 is rejected on the same basis as Claims 1-12, 15-16.

With respect to Claims 24, the Applicant describes a identity-providing node with the same limitations as described in Claims 1-12, 15-16. Claims 24,27 are rejected on the same basis as Claims 1-12, 15-16.

With respect to Claim 25, Schuster disclosed (currently amended) A computer program arranged to control a NAT control node, said NAT control node (Schuster-



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Figures 1, Item 24) comprising an input arranged to receive a control message (Schuster - Column 19 Lines 15-30) comprising information about the identity of one of the NATs; (Column 19 Lines 40-65) and a processor arranged to issue messages to the identified NAT in order to control it; such that in use the NAT control node is able to control the identified NAT without the need to maintain its own store of information about the identities of the NATs (Schuster - Column 24 Lines 5-10) and without the need to maintain its own discovery mechanism to discover the identities of the NATs; the computer program comprising program code executable by the processor in order to enable the NAT control node to: - receive a control message comprising information about the identity of one of the NATs; (Schuster - Column 19 Lines 15-30) and to issue messages to the identified NAT in order to control it.

With respect to Claims 26 and 28, the Applicant describes a computer program in a medium for the computer program in Claim 25. Claims 26 and 28 are rejected on the same basis as Claim 25.

With respect to Claim 27, Schuster disclosed (currently amended) A computer program arranged to control a NAT identity-providing node, said NAT identity providing node (Schuster – Figure 1 Items 26, 38, 40, 44) comprising an input arranged to receive a control message comprising information about one of a plurality of entities in the communications network; (Column 22 Lines 15-25) a processor arranged to determine the identity of a first NAT connected to said one entity; and an output

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arranged to send said identity to a NAT control node in the communications network: (Column 21 Lines 45-55) and wherein said NAT-identity providing node is arranged to be closer in said communications network to said one of the entities than the NAT control node: the computer program comprising program code executable by the processor in order to enable the NAT identity-providing node to receive a control message comprising information about one of a plurality of entities in the communications network; (Column 22 Lines 15-25) to determine the identity of a first NAT connected to said one entity; and send said NAT identity to a NAT control node in the communications network. (Column 23 Lines 30-35)

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 4,5,20,29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Schuster et al. (US Patent 6822957) hereinafter referred to as Schuster, in view of Huitema (IETF Working Document 'MIDCOM Scenarios'), further in view of Handley et al. ( IETF Working Document RFC2327 'SDP:Session Description Protocol'), hereinafter referred to as Handley .

With respect to Claim 4, Schuster does not disclose a method as claimed in claim 2 wherein said control message is a session description protocol (SDP) message.

With respect to Claim 5, Schuster does not disclose a method as claimed in claim 4 wherein said identity is added to an SDP message using a pre-specified SDP attribute.

With respect to Claim 20, Schuster does not disclose a communications network as claimed in claim 19 wherein said control message is a session description protocol message.

With respect to Claim 29, Schuster did not disclose wherein the first middlebox is arranged to act as two or more independent middleboxes and wherein the step of providing the identity of the first middlebox to the middlebox control node comprises providing the identity of the first middlebox and the identity of a particular middlebox functionality relating to one of said two or more independent middleboxes that is to be used.

The Examiner notes that regarding '*two or more independent middleboxes*', the courts have ruled that mere duplication of parts has no patentable significance unless a new and unexpected result is produced. Thus, this limitation is interpreted to mean a singular middlebox that is able to perform the functions of two middleboxes.

Handley disclosed (re. Claims 4,5,20,29) of the Session Description Protocol including specifications for passing pre-defined attributes regarding the session and media involved in the session. The 'attribute' mechanism ("a=" described below) is the

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primary means for extending SDP and tailoring it to particular applications or media.

Some attributes (the ones listed in this document) have a defined meaning but others may be added on an application-, media- or session-specific basis. (Handley - Section 6 – SDP Specification)

The Examiner notes (re. Claim 29) that it would have been well known in the art that the SDP 'attribute' mechanism allows for application-specific control information, and thus would have enabled the middlebox to distinguish the different functionalities required for the session.

Schuster, Huitema and Handley are analogous art because they present concepts and practices regarding communication control for middlebox devices such as NATs and firewalls. At the time of the invention it would have been obvious to combine the teachings regarding pre-defined attributes mechanisms on SDP messages by Handley into the combined teachings of Huitema and Schuster. The said combination of Handley into the combined network of Huitema and Schuster would facilitate sending the identity information from the middlebox to the other devices in the network. The motivation for said combination would have been, as Handley suggests, in order to have a standard format for session initiation-related information, using text in the ISO 10646 character set in UTF-8 encoding for enhanced portability. The encoding was designed with strict order and formatting rules so that most errors would result in malformed announcements which could be detected easily and discarded. This also allows rapid

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discarding of encrypted announcements for which a receiver does not have the correct key. (Section 6 – SDP Specification)

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over Schuster et al. (US Patent 6822957) hereinafter referred to as Schuster, in view of Huitema (IETF Working Document 'MIDCOM Scenarios'), further in view of Handley et al. ( IETF Working Document RFC2327 'SDP:Session Description Protocol'), hereinafter referred to as Handley, further in view of Srisuresh et al. (IETF Working Document ' Middlebox Communication Architecture and Framework'), hereinafter referred to as Srisuresh.

With respect to Claim 13, the combination of Schuster, Huitema and Handley do not disclose a method as claimed in claim 1 wherein said NAT control node is a MIDCOM agent.

Srisuresh discloses the MIDCOM Architecture and Framework wherein the middlebox controlling node is called a MIDCOM agent. Srisuresh discloses said MIDCOM agents to be nodes external to a middlebox, possessing a combination of application specific intelligence and knowledge of middlebox function so as to assist the middleboxes to perform their functions. (Section 4.0 MIDCOM Agents)

Schuster , Huitema, Handley and Srisuresh are analogous art because they present concepts and practices regarding communication control for middlebox devices such as NATs and firewalls. At the time of the invention it would have been obvious to combine the teachings on MIDCOM agents by Srisuresh into the combination of Schuster , Huitema, and Handley . The combination of Srisuresh into the network of Schuster, Huitema, and Handley would 1) allow the registration servers, proxy servers, and other network devices configured for distributed network address translation to be enabled as a MIDCOM agents. The motivation for said combination would have been, as Srisuresh suggests, to take advantage of existing in-path and out-of-path devices that already possess the application intelligence. (Section 4.1.1 In-Path MIDCOM Agent Illustration)

Therefore it would have been obvious to combine Srisuresh into the combination of Huitema, Schuster, and Handley in order to arrive at the invention as described in Claim 13.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 17 is rejected under 35 U.S.C. 103(a) as being unpatentable over Schuster et al. (US Patent 6822957) hereinafter referred to as Schuster, in view of Huitema (IETF Working Document 'MIDCOM Scenarios'), further in view of Handley et al. ( IETF Working Document RFC2327 'SDP:Session Description Protocol'), hereinafter referred to as Handley, further in view of Mahler et al. (US Patent 6381638), hereinafter referred to as Mahler .

With respect to Claim 17, the combination of Schuster, Huitema, and Handley do not disclose a method as claimed in claim 1 wherein said middlebox-identity-providing node is arranged to determine the identity of the first middlebox by automatically analysing the communications network.

Mahler discloses of communication protocol for NAT type devices, wherein the NAT router intercepts an outgoing packet and changes the source IP address of the

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packet equal to the IP address of the router itself. The modified packet is forwarded to the destination server. The socket created by the server reflects that the connection is between itself and the router, even though the actual connection is between itself and the originating host. (Column 4 Lines 10-50) Mahler also describes 1) sending router identifier information to the servers and 2) using address and port mapping tables in order to maintain recognition of the NAT router and reduce address translation during the actual session. (Figure 9, Column 11 Lines 55-65, Column 12 Lines 1-25) Using said protocol and method the server and other devices in the network are made aware of the NAT router.

Schuster, Huitema, Handley, and Mahler are analogous art because they present concepts and practices regarding communication control for middlebox devices such as NAT routers.

The Examiner respectfully suggests that at the time of the invention it would have been obvious to combine the teachings on detecting NAT devices by Mahler into the combination of Schuster, Huitema, and Handley. The combination of Mahler into the combination of Schuster, Huitema, and Handley would 1) other device in the network to detect the NAT device and determine the NAT device identification information. The suggested motivation for said combination would have been, as Mahler suggests, in order to overcome shortcomings for certain protocols when used in conjunction with NAT devices. (Column 3 Lines 1-10)



***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 30,31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Schuster et al. (US Patent 6822957) hereinafter referred to as Schuster, in view of Huitema (IETF Working Document 'MIDCOM Scenarios'), further in view of Handley et al. ( IETF Working Document RFC2327 'SDP:Session Description Protocol'), hereinafter referred to as Handley, further in view of Collins (US Publication 2003/0055978) hereinafter referred to as Collins.

Schuster, Huitema, and Handley do not disclose (re. Claims 30,31) a discovery algorithm to automatically obtain information about the identity of middleboxes in the communications network.

Collins disclosed (re. Claims 30,31) pre-established mappings between the NAT devices and the local nodes connected behind the NATs.

At the time of the invention it would have been obvious to combine the teachings on detecting NAT devices by Collins into the combination of Schuster, Huitema, and Handley. The motivation for said combination would have been, as Collins suggests

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(Paragraph 05), to overcome limitations with NATs arising from outside-initiated traffic flow.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-3,6-12, 15-16, 18-19, 23-25, 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Xu et al. (US Publication 2002/0114322) hereinafter referred to as Xu, in view of Huitema (IETF Working Document 'MIDCOM Scenarios').

With respect to Claim 1, Xu discloses a method of controlling one of a plurality of NAT/Firewalls in a communications network, each of the NAT/Firewalls being connected to a plurality of entities in a respective one of a plurality of address realms of the communications network, (Figures 1-2B) said method comprising the steps of:

(i) receiving a control message at a NAT/Firewall-identity-providing node (Figure 1, Items 14a, Item 14b, and Item 20) in the communications network, said control

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message comprising information about one of the entities in the communications network; (Page 4 Paragraph 49)

(ii) using the NAT/Firewall identity-providing node to determine the identity of a first NAT/Firewall connected to said one entity in its respective one of the plurality of address realms; (Page 4 Paragraph 51)

(iii) sending said identity to a NAT/Firewall control node in the communications network in order to enable said NAT/Firewall control node to send control messages to said first NAT/Firewall ; said NAT/Firewall control node being located in a different address realm than that of said one of the entities;

and wherein the NAT/Firewall -identity-providing node (Items 14a , 20) is separate from the NAT/Firewall control node (Item 18) and located in a control signal path from said one of the entities to the NAT/Firewall control node. (Page 5 Paragraph 52-55, Page 8 Paragraph 94-97)

Xu did not disclose (re. Claim 1) a middlebox device in the network.

Huitema disclosed (re. Claim 1) that a middlebox may be a NAT inside a private network. (Huitema - Page 1, Abstract) Thus, the middlebox described in Claim 1 is equivalent to the NAT/Firewall disclosed by Xu.

Huitema disclosed of different scenarios for describing the MIDCOM protocol as used for devices in the network that provide transport policy enforcement. Huitema disclosed that examples of said 'policy enforcement' devices include firewall and network address translators, such devices being a subset of what are otherwise referred to as 'middleboxes'. (Huitema - Page 1, Abstract) Huitema also disclosed (re. Claims 4,5,20,21) that session description protocol (SDP) messages may be used to initiate and facilitate the communication control process between the middleboxes and the other devices involved. The SDP messages may include identification information regarding the middlebox.( Huitema – Page 13, Section 2.3.6 Multiple Ports, Port Ranges)

Xu and Huitema are analogous art because they present concepts and practices regarding communication control for middlebox devices such as NATs and firewalls.

At the time of the invention it would have been obvious to combine the teachings on middleboxes and SDP messages by Huitema into Xu . The combination of Huitema into the network of Xu would 1) enable the devices in the network to communicate and pass identification information using the SDP messages, and 2) enable the Call Control Manager (CCM) server of Xu to recognize and control the NAT/firewall as a 'middlebox'. The suggested motivation for said combination would be, as Huitema suggests, enable the network of Xu to 1) allow for third parties to provide transport policy enforcement, and 2) overcome the traversal scenarios that Huitema describes. (Abstract, Introduction)

With respect to Claim 2, Xu discloses a method as claimed in claim 1 wherein said step (iii) of sending said identity comprises adding said identity to a control message and sending said control message. (Page 4 Paragraph 51)

With respect to Claim 3, Xu discloses a method as claimed in claim 2 wherein additional information is also added to the control message. (Page 4 Paragraph 51)

With respect to Claim 6, Xu discloses a method as claimed in claim 1 wherein said control message is a call set-up message and said method is arranged to control said first NAT/Firewall in order to set-up a call from said one entity to another entity connected to a second NAT/Firewall in the communications network. (Page 4 Paragraph 51, Page 5 Paragraph 61-64)

With respect to Claim 7, Xu discloses a method as claimed in claim 6 wherein said second NAT/Firewall is connected to a plurality of entities in a second address realm different from the first address realm of the entities connected to the first NAT/Firewall. (Figure 1, Page 4 Paragraph 41)

With respect to Claim 8, Xu discloses a method as claimed in claim 7 wherein the NAT/Firewall control node is within a third address realm different from the first and second address realms. (Figure 1, Page 4 Paragraph 41)

With respect to Claim 9, Xu discloses a method as claimed in claim 8 wherein the third address realm is public. (Figure 1, Page 4 Paragraph 41)

With respect to Claim 10, Xu discloses a method as claimed in claim 9 wherein the first and second address realms are private. (Figure 1, Page 4 Paragraph 41)

With respect to Claim 11, Xu discloses a method as claimed in claim 1 wherein the NAT/Firewall -identity-providing node is selected from: one of the NAT/Firewalls; a gateway in the communications network; said one entity, being a user terminal in the communications network; a gateway comprising a business services channel manager (BSCM). (Figure 1, Page 4 Paragraph 41)

With respect to Claim 12, Xu discloses a method as claimed in claim 6 wherein said call passes through two or more NAT/Firewalls and wherein information about the identity of each such NAT/Firewall is added to said control message. (Page 5 Paragraph 61-64)

With respect to Claim 15, Xu discloses a method as claimed in claim 1 wherein each of the NAT/Firewall es is selected from, a firewall, a network address translator (NAT), and a quality of service device . (Figure 1, Page 4 Paragraph 41)

With respect to Claim 16, Xu discloses a method as claimed in claim 1 wherein said NAT/Firewall -identity-providing node is arranged to determine the identity of the first NAT/Firewall by using pre-specified information.

With respect to Claims 18-19, the Applicant describes a communications network having the same limitations as described in Claims 1-12, 15-16. Claims 18-19 are rejected on the same basis as Claims 1-12, 15-16.

With respect to Claim 22, Xu discloses a signal as claimed in claim 21 wherein said information about the identity of a middlebox is selected from, a fully-qualified domain name (FQDN) and an internet protocol address. (Page 5 Paragraph 52, Page 8 Paragraph 94)

With respect to Claims 23, the Applicant describes a control node with the same limitations as described in Claims 1-12, 15-16. Claims 23 is rejected on the same basis as Claims 1-12, 15-16.

With respect to Claims 24 the Applicant describes a identity-providing node with the same limitations as described in Claims 1-12, 15-16. Claims 24 is rejected on the same basis as Claims 1-12, 15-16.

With respect to Claim 25, Xu disclosed (currently amended) A computer program arranged to control a NAT control node, said NAT control node (Xu – Figure 1 Item 18) comprising an input arranged to receive a control message (Xu – Paragraph 49) comprising information about the identity of one of the NATs; and a processor arranged to issue messages to the identified NAT in order to control it; such that in use the NAT control node is able to control the identified NAT without the need to maintain its own store of information about the identities of the NATs and without the need to maintain its own discovery mechanism to discover the identities of the NATs; the computer program comprising program code executable by the processor in order to enable the NAT control node to: - receive a control message comprising information about the identity of one of the NATs; (Xu – Paragraph 49) and to issue messages to the identified NAT in order to control it. (Xu – Paragraph 52-55, Paragraph 94-97)

With respect to Claim 27, Xu disclosed (currently amended) A computer program arranged to control a NAT identity-providing node, said NAT identity providing node (Figure 1 Item 14, Item 16) comprising an input arranged to receive a control message comprising information about one of a plurality of entities in the communications network; (Xu - Paragraph 49) a processor arranged to determine the identity of a first NAT connected to said one entity; and an output arranged to send said identity to a NAT control node in the communications network: (Paragraph 49) and wherein said NAT-identity providing node is arranged to be closer in said



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communications network to said one of the entities than the NAT control node: the computer program comprising program code executable by the processor in order to enable the NAT identity-providing node to receive a control message comprising information about one of a plurality of entities in the communications network;

(Paragraph 49) to determine the identity of a first NAT connected to said one entity;

and send said NAT identity to a NAT control node in the communications network.

(Paragraph 52-55, Paragraph 94-97)

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 4,5,20,29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Xu et al. (US Publication 2002/0114322) hereinafter referred to as Xu, in view of Huitema (IETF Working Document 'MIDCOM Scenarios'), further in view of Handley et al. ( IETF Working Document RFC2327 'SDP:Session Description Protocol'), hereinafter referred to as Handley .

The combination of Xu and Handley did not disclose (re. Claims 4,5,20,29) using the SDP protocol for passing session initiation information.

The combination of Xu and Handley did not disclose (re. Claim 29) wherein the first middlebox is arranged to act as two or more independent middleboxes and wherein the step of providing the identity of the first middlebox to the middlebox control node comprises providing the identity of the first middlebox and the identity of a particular middlebox functionality relating to one of said two or more independent middleboxes that is to be used.

The Examiner notes that regarding '*two or more independent middleboxes*', the courts have ruled that mere duplication of parts has no patentable significance unless a new and unexpected result is produced. Thus, this limitation is interpreted to mean a singular middlebox that is able to perform the functions of two middleboxes.

Handley disclosed (re. Claims 4,5,20) of the Session Description Protocol including specifications for passing pre-defined attributes regarding the session and media involved in the session. The 'attribute' mechanism ("a=" described below) is the primary means for extending SDP and tailoring it to particular applications or media. Some attributes (the ones listed in this document) have a defined meaning but others may be added on an application-, media- or session-specific basis. ( Handley - Section 6 – SDP Specification)

The Examiner notes (re. Claim 29) that it would have been well known in the art that the SDP 'attribute' mechanism allows for application-specific control information,

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and thus would have enabled the middlebox to distinguish the different functionalities required for the session.

Xu , Huitema and Handley are analogous art because they present concepts and practices regarding communication control for middlebox devices such as NATs and firewalls. At the time of the invention it would have been obvious to combine the teachings regarding pre-defined attributes mechanisms on SDP messages by Handley into the combined teachings of Huitema and Xu . The said combination of Handley into the combined network of Huitema and Xu would facilitate sending the identity information from the middlebox to the other devices in the network. The suggested motivation for combining would have been, as Handley suggests, in order to have a standard format for session initiation-related information, using text in the ISO 10646 character set in UTF-8 encoding for enhanced portability. The encoding was designed with strict order and formatting rules so that most errors would result in malformed announcements which could be detected easily and discarded. This also allows rapid discarding of encrypted announcements for which a receiver does not have the correct key. (Section 6 – SDP Specification)

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over Xu et al. (US Publication 2002/0114322) hereinafter referred to as Xu, in view of Huitema (IETF Working Document 'MIDCOM Scenarios'), further in view of Handley et al. ( IETF Working Document RFC2327 'SDP:Session Description Protocol'), hereinafter referred to as Handley, further in view of Srisuresh et al. (IETF Working Document ' Middlebox Communication Architecture and Framework'), hereinafter referred to as Srisuresh.

With respect to Claim 13, the combination of Xu and Huitema do not disclose a method as claimed in claim 1 wherein said NAT/Firewall control node is a MIDCOM agent.

Srisuresh discloses the MIDCOM Architecture and Framework wherein the middlebox controlling node is called a MIDCOM agent. Srisuresh discloses said agents to be nodes external to a middlebox, possessing a combination of application specific

intelligence and knowledge of middlebox function so as to assist the middleboxes to perform their functions. (Section 4.0 MIDCOM Agents)

Xu , Huitema, Handley and Srisuresh are analogous art because they present concepts and practices regarding communication control for middlebox devices such as NATs and firewalls. The Examiner respectfully suggests that at the time of the invention it would have been obvious to combine the teachings on MIDCOM agents by Srisuresh into the combination of Xu , Huitema, and Handley . The combination of Srisuresh into the network of Xu, Huitema, and Handley would 1) allow the CCM server to be enabled as a MIDCOM agent. The suggested motivation for doing so would have been, as Srisuresh suggests, to take advantage of existing in-path and out-of-path devices that already possess the application intelligence. (Section 4.1.1 In-Path MIDCOM Agent Illustration)

Therefore it would have been obvious to combine Srisuresh into the combination of Huitema, Xu, and Handley in order to arrive at the invention as described in Claim 13.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the

invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 17 is rejected under 35 U.S.C. 103(a) as being unpatentable over Xu et al. (US Publication 2002/0114322) hereinafter referred to as Xu, in view of Huitema (IETF Working Document 'MIDCOM Scenarios'), further in view of Handley et al. (IETF Working Document RFC2327 'SDP:Session Description Protocol'), hereinafter referred to as Handley further in view of Elgebaly et al. (US Publication 2002/0152325), hereinafter referred to as Elgebaly .

With respect to Claim 17, the combination of Xu, Huitema, and Handley do not disclose a method as claimed in claim 1 wherein said middlebox-identity-providing node is arranged to determine the identity of the first middlebox by automatically analysing the communications network.

Elgebaly discloses of communication protocol for NAT type devices, wherein the receiver of protocol data are configured to inspect endpoint values. If an embedded address is non-routable, NAT has been detected. (Page 2 Paragraphs 19-20, Paragraphs 23-27, Page 4 Paragraph 45-47)

Xu, Huitema, Handley, and Elgebaly are analogous art because they present concepts and practices regarding communication control for middlebox devices such as NATs and firewalls.

The Examiner respectfully suggests that at the time of the invention it would have been obvious to combine the teachings on detecting NAT devices by Elgebaly into the combination of Xu, Huitema, and Handley. The combination of Elgebaly into the combination of Xu, Huitema, and Handley would 1) other device in the network to detect the NAT device and determine the NAT device identification information. The suggested motivation for doing so would have been, as Elgebaly suggests, in order to overcome shortcomings for certain protocols when used in conjunction with NAT devices. (Page 1 Paragraph 4-6)

Therefore it would have been obvious to combine Elgebaly into the combination of Xu, Huitema, and Handley, in order to arrive at the invention as described in Claim 17.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 30,31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Xu et al. (US Publication 2002/0114322) hereinafter referred to as Xu, in view of Huitema (IETF Working Document 'MIDCOM Scenarios'), further in view of Handley et al. ( IETF

Working Document RFC2327 'SDP:Session Description Protocol'), hereinafter referred to as Handley, further in view of Collins (US Publication 2003/0055978) hereinafter referred to as Collins.

Xu, Huitema, and Handley do not disclose (re. Claims 30,31) a discovery algorithm to automatically obtain information about the identity of middleboxes in the communications network.

Collins disclosed (re. Claims 30,31) pre-established mappings between the NAT devices and the local nodes connected behind the NATs.

At the time of the invention it would have been obvious to combine the teachings on detecting NAT devices by Collins into the combination of Xu, Huitema, and Handley. The motivation for said combination would have been, as Collins suggests (Paragraph 05), to overcome limitations with NATs arising from outside-initiated traffic flow.

### ***Response to Arguments***

Applicant's arguments filed 10/10/2005 have been fully considered but they are not persuasive.

The Examiner notes that the rejections based on Xu has not been discussed by the Applicant. The Examiner maintains the prior art rejection(s) based on Xu.



The Applicant presents the following argument(s) [*in italics*]:

*Schuster is silent on whether the third computer network 32 comprises a further address realm. In any event, for a call connection between say a telephony enabled device 22 in first computer system 12 and network phone 39 of second computer network 30, network address translation need only be performed at the router (NAT) 26 of first computer network 12 but not at the edge of second computer system 30.*

Regarding 'a respective one of a plurality of address realms', Schuster disclosed using 'Realm Specific Internet Protocol' (Schuster – Column 3 Lines 30-35) , thus indicating communication between plurality of address realms in the system, as evidenced in Figure 1. Schuster also disclosed support for Virtual Private Networks (VPN), each VPN comprising a distinct address realm. Schuster also disclosed three separate and distinct networks (Column 15 Lines 60-65).

Schuster's disclosure is not limited to communication between a private LAN and a public telephone. (Column 5 Lines 50-55)

The Examiner notes that given Schuster's disclosure, it would have been obvious to a person of ordinary skill in the art that the second and third computer systems may be identical to the first computer system 12, such that both second and third computer systems would comprise of a router (NAT) similar to router (NAT) 26, and wherein second and third computer system would comprise a separate address realm. Following this example scenario, routers 26B and 26C would represent the NAT for the

second and third computer systems respectively. Thus, address translation is required between the three separate address realms.

In disclosing the routers and NAT nodes in the system disclosed by Schuster, the combination of Schuster and Huitema has disclosed a middlebox identity-providing node. In Column 23 Lines 10-15 Schuster disclosed that the router may also be acting as an RSIP gateway, which may also act as a middlebox identity-providing node. Furthermore in Column 23 Lines 15-30 Schuster disclosed of a proxy server that may also act as a middlebox control node. Thus the combination of Schuster and Huitema disclosed a middlebox identity-providing node and a middlebox control node.

Following the scenario described above, each of the three computer systems may have an RSIP gateway [*middlebox identity-providing node*] and a proxy server [*middlebox control node*].

The Applicant presents the following argument(s) [*in italics*]:

*' in Schuster, the NAT control node 24 comprises one of the entities in said same address realm.'*

Regarding the limitation '*middlebox control node is located in a different address realm to that of the said one of the entities*', Schuster disclosed that 'network phones

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such as network phones 22 and 39 may each contain a SIP client and a SIP server.

The proxy server 24 may also contain a SIP client and a SIP server. Additional user agents may be included in the network 10, as may additional proxy servers.' (Schuster-Column 6 Lines 60-65) Following the scenario described above, since network phone (39) [comprising a server] is in a different address realm than the router (26)

[middlebox], it would be obvious that each realm may be equipped with a proxy server that serves as a middlebox control node. Schuster also disclosed that each proxy server [acting as middlebox control node] is able to receive requests from network phones [entities] that reside in other realms (Column 17 Lines 15-20).

Xu clearly indicates a plurality of address realms as evidence by the private networks 34a and 34b, with public network 12, where the middlebox control node (18- 'CCM server') is in a different address realm than the client entities (Items 30a, 30d).

The Applicant presents the following argument(s) [*in italics*]:

*'From the disclosure of Schuster, applicants cannot derive any reason why any of items 26, 38, 40 and 44 (NAT identity providing node) would send the identity of router 26 (first NAT) to proxy telephony server 24 (NAT control node)...'*

Following the example scenario described above, each of the three computer systems will have a proxy server, labeled 24, 24B, and 24C respectively. As disclosed by Schuster Column 23 Lines 30-35, proxy server **24B in the second computer system**, for example, receives the identity [external address 28] of router 26.

The Examiner notes that the RSIP protocol is an architecture that allows the hosts within the first (e.g., private) routing realm to directly use addresses and other routing parameters from the second (e.g., public) routing realm. Thus, RSIP has been defined as a method for address sharing that exhibits more transparency than NAT. In particular, RSIP requires that an RSIP gateway (a router or gateway between the two realms) assign at least one address from the second routing realm, and perhaps some other resources, to each RSIP host.

Taken in the context of implementing the preferred embodiment using RSIP (Schuster-Abstract), where the RSIP host is the proxy server [control node], the Examiner notes that disclosed 'sending the identity of the NAT to the control node, where the control node is in a different address realm'.

### ***Conclusion***

**Examiner's Note:** Examiner has cited particular columns and line numbers in the references applied to the claims above for the convenience of the applicant.

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Although the specified citations are representative of the teachings of the art and are applied to specific limitations within the individual claim, other passages and figures may apply as well. It is respectfully requested from the applicant in preparing responses, to fully consider the references in entirety as potentially teaching all or part of the claimed invention, as well as the context of the passage as taught by the prior art or disclosed by the Examiner.

In the case of amending the claimed invention, Applicant is respectfully requested to indicate the portion(s) of the specification which dictate(s) the structure relied on for proper interpretation and also to verify and ascertain the metes and bounds of the claimed invention.

**THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

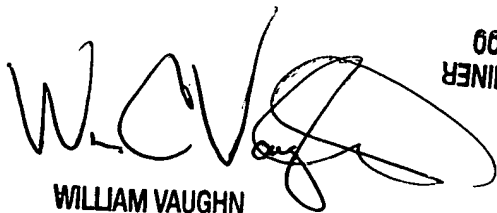
A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Greg Bengzon whose telephone number is (571) 272-3944. The examiner can normally be reached on Mon. thru Fri. 8 AM - 4:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, William Vaughn can be reached on (571) 272-3922. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

gcb

  
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